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ABSTRACT

Reviewed was research on the application of operant conditioning techniques to the modification of the classroom behavior of learning disabled students. The methodology and results of the studies were examined and each study summarized. It was concluded that there was little common interpretation of the term "learning disabilities" and that all of the studies had violated one or more of the following requirements of good experimental design: (1) adequate description of subjects, (2) proper sampling techniques, (3) adequate control procedures, (4) statistical analysis of the data, and (5) evaluation of long-term gains. (Author/IM)

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Use of Behavior Modification with L.D. Students

Frank P. Belcastro

The use of behavior modification techniques has received considerable attention and a number of investigations have indicated that these techniques can be highly effective in the beneficial change of social and academic behaviors of nornal and exceptional children. Recent research reveals that these techniques have been applied to mentally retarded children(33), socially disruptive children(4), the deaf(20), the speech impaired(7), the emotionally disturbed(18), the learning disabled(6), and other areas of exceptionality(24).

this review will limit itself to the use of behavior modification with learning disabled children and only in a classroom setting--a setting which is ideally suited for behavior modification in that the necessary environmental variables are set, specified, and to some extent controlled by the teacher. While there are several articles in the descriptive literature(14; 34; 35) on the use of behavior modification in

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the area of learning disabilities, this review will further limit itself to the research literature.

In considering the use of behavior modification techniques with learning disabled students, the research literature divides itself into two broad categories of maladaptive behavior--social and academic.

Social maladaptive behavior

The research in this area reported the modification of such diverse behaviors as attending to work, facial grimaces, hyperactivity, size discrimination, and disruptive classroom behaviors.

Novy et al.(23) demonstrated that a token reinforcement system could modify the attending-to-work behavior of a nine-year-old boy in a learning disabled class. In this study the subject improved in his behavior by more than 50% above his baseline performance.

Both contingency management procedures (self-recording, teacher praise, and candy) and psychotropic medication (diphenhydramine hydrochloride) were applied to a five-year-old boy in an attempt to decelerate facial grimaces. Median tests revealed that there was a statistically significant difference attributable to the reinforcement contingencies but none attributable to medication(30).

Exploration of the use of respiration feedback as part of a breathing control and attention training technique for the control of hyperactive behavior was the purpose of the study by Simpson et al.(28). Six children, ages 6 - 8 years old, from a private school for children with learning disabilities participated in the study, three assigned to the experimental group and three assigned to the control group. Although no statistical analyses were carried out, inspection of the descriptive statistics did not provide support for the effectiveness and feasibility of using respiration records, breathing control, and attention training for the control of hyperactivity behavior in children.

Allen(1) presented 6 case studies covering classes of behavior which she deemed necessary to general learning ability and classroom performance: gross motor skills, social behavior, personality adjustment, intellectual behaviors, span of attention, and verbal skills. In each of the case studies, the child (ranging from pre-school to school age) was deficient in one of the above classes of behavior and improvement in this deficiency was attributed to making adult social reinforcement contingent on the appropriate behavior.

Differences in the effectiveness of tangible and intangible reinforcement (confirmation of response) on

simple learning behavior (a three-size discrimination task) among groups of fourth-grade academically achieving and underachieving children were investigated by Shores(27). Statistically significant differences reflected (a) a generally more adequate performance on the part of the middle class and (b) an inhibitory effect of the tangible reinforcer on the learning of the lower class learning disabilities group but an enhancement effect of the tangible reinforcer on the learning of the middle class learning disabilities group.

A combination of social (ignoring of inappropriate behaviors), object (candy), and token reward system (redeemable chips) was used to reduce hitting by 82%, spraying noises by 94%, name calling by 91%, and callingout by 99% in a primary class of nine learning disabled children(10).

Academic maladaptive behavior

Most of the research in this area examined the modifications of behaviors in the academic areas of reading and arithmetic.

McKenzie et al.(19) reported that a token reinforcement system with grades as tokens and with allowances as added back-up reinforcers significantly increased

reading and arithmetic behaviors of eight learning disabled children(ages 10 - 13). Despite achievement levels at the beginning of the experiment of two years or more below normal in one or more academic areas, during the year six of the eight children were returned full time to regular classes and then at the end of the school year promoted by their regular classroom teacher.

Individualized reading and arithmetic programs were arranged for each of eight junior high school students enrolled in a learning disabilities classroom and activities known to be highly interesting to the students were established as reinforcement contingencies for their reading and arithmetic behaviors. Average gains of 2.6 years in arithmetic and 2.0 years in reading were recorded over a teaching period of approximately 20 weeks(22).

Three of four dyslexic boys (grades 3 - 5) evaluated as being one to five years retarded in reading skills exhibited significantly higher average correct reading responses and also progressed in instructional reading levels from one and one-half to four years over five months of instruction. Haring and Hauck(11) reported that instruction consisted of programmed reading materials utilizing a token reinforcement system.

Fygetakis and Ingram(8) demonstrated that a five-year-old aphasic girl advanced over a five-month period from a stage with primitive one-and-two-word utterances to a stage where three-word utterances predominated and where the use and complexity of basic grammatical relations increased through the use of a linguistic program which combined recent knowledge about the acquisition of English with techniques of behavior modification.

A group of ten third-grade boys was diagnosed as learning disabled and were taught reading under three conditions: tutoring at a private clinic, token reinforcement program in a self-contained classroom and token reinforcement during integration into a regular classroom. Wadsworth(32) concluded that improvement in reading level was not statistically significant during the three-month tutoring period but that statistically significant differences were found during the two token reinforcement periods, the three-month self-contained classroom period (eight-month gain in reading performance) and the five-month transition period (nine-month gain).

During a three-week period, three learning disabled students (ages 12 - 16) were taught to apply principles of behavior modification to school-related problems

of three of their schoolmates (ages 5 - 8). The results revealed that the tutors were able to modify the problems of capital letter recognition (from 22% to 88% recognition), beginning of an assignment (from an average 11.5 minutes to get started to immediately getting started on an assignment), and the completion of an assignment (from 33.3% to 92.6% assignments completed) (6).

DISCUSSION

Description of Subjects

While it is clear that the above studies made use of behavior modification, it is not at all certain that the subjects were learning disabled.

The National Advisory Committee on Handicapped Children(21) formulated a concise definition of learning disabilities which was later incorporated into Congressional legislation.

> Children with special learning disabilities exhibit a disorder in one or more of the basic psychological processes involved in understanding or using spoken or written languages. These may be manifested in disorders of listening, thinking, talking, reading, writing, spelling or arithmetic. They include conditions which have been referred to as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, developmental aphasia, etc. They do not include learning problems which are due primarily to visual, hearing, or motor handicaps, to mental retardation, emotional disturbance, or to environmental disadvantage.

Nearly all of the authors used the term "learning disabilities." However, in their description of their subjects, four of the studies(28, 6, 30, 27) did not meet the critical restrictions in this definition; an additional four studies(10, 23, 1, 22) had such inadequate subject descriptions that their satisfaction of the definition criteria was in doubt; only four of the 12 studies(8, 32,19, 11) described their subjects sufficiently to determine that they had met the definition restrictions. Further, these same conditions held when four other definitions(13, 17, 3, 15) were applied.

To demonstrate the non-conformity to definition, one author(28) cited several research studies as using behavior modification in the treatment of children with learning disabilities; yet an investigation of these studies revealed that nearly all of them dealt with socially disruptive children.

Thus, it appears that the general rather than the technical use of the term "learning disabilities" predominates. These varied interpretations of the term confuse the consumer of research and appear to represent a disservice.

While there may be great merit to not labeling students(29, 26, 25) and despite the major pitfalls of totally abandoning traditional labeling(12), detailed,

accurate, objective description of the subject in research studies must be supplied so that the results of any given study can be evaluated. Subjective description such as "exceedingly frail, withdrawn, and passive child"(1) is not helpful.

External Validity

That five of the studies(23, 6, 1, 8, 30) were single-subject ones hinders generalization of the results. Granting that the study of a single subject reveals a reliable relationship between treatment and behavior changes, generalization of these results is tenuous for it could be that the results are unique to that subject in the circumstances studied.

Acknowledging the Birnbrauer et al.(5) contention for both group and single-subject studies that generalization from past research to new cases always involves a degree of inductive uncertainty, nevertheless one can generalize with a greater degree of certainty (and a lesser degree of inductive uncertainty) from group results than from single-subject results.

Additionally, four(6, 30, 1, 8) of the five single-subject studies employed the so-called AB design: (a) baseline period--assessment of dependent variable before treatment, (B) treatment period--assessment of

dependent variable throughout treatment. In this design the subject acts as his own control and such a procedure does not require a no-treatment group; however, while the four studies did not do so, the methodology gains added precision when a no-treatment group is included. A weakness of the AB design is that it does not control the effects of non-simultaneity. A more rigorous design would be the ABAB design(2).

Controls

Central to a good experimental design is the problem of adequate controls. The purpose of establishing control groups is to eliminate any possible influences of extranious variables on the dependent variable(9). Yet six(32, 11, 27, 19, 10, 22) of the seven group studies used no control group. Thus, it was "impossible to tell whether the changes resulted from the conditions inserted by the investigator or from some factor or factors which occurred between the two testings"(31).

Statistical Analysis

The most elementary requirements of research demand statistical analysis of the data. Yet, seven (22, 10, 6, 23, 28, 8, 1) of the 12 studies failed this requirement. Without inferential data analysis it can-

not be determined whether the differences observed are true differences or merely differences due to chance sampling fluctuation; nor can the confidence to be placed in the results of a study be determined. Thus, statistical inference helps avoid subjective decisions. Perhaps the recommendation of Kelly et al.(16) for the use of multiple regression linear analysis to answer specific behavior modification research questions should be heeded.

Long-range gains

Included in design of all research in this area should be some provision for periodic assessment to measure long-term gains in order to determine the permanence of behavior change. That this has been an area of neglect was confirmed by the fact that ten(28, 6, 30, 27, 10, 23, 8, 32, 19, 11) of the 12 studies carried out no formal follow-up evaluations.

Summary

A review of the research literature in the area of school use of behavior modification with learning disabled students pointed out that there was little common interpretation of the term "learning disabilities" by the authors of the review researches. It also

revealed that all of the studies had violated one or more of the following requirements of good experimental design: (a) adequate description of subjects, (b) proper sampling techniques, (c) adequate control procedures, (d) statistical analysis of the data, and (e) evaluation of long-term gains. Behavior modification researchers in the learning disabilities field need to adopt these procedures in order to introduce a methodological precision which is currently lacking in the field.

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